Appendix H

FORECASTS OF AVIATION DEMAND

Aviation forecasts represent a key component in determining future airside and landside development needs. Based aircraft forecasts largely establish the need for aircraft storage space (e.g., hangars) and other landside developments at an airport, while operations forecasts help to determine the need for airside and landside improvements.

Forecasts were developed for based aircraft and operations at Ellington Airport. The forecasts are presented in five-year intervals, with a base year of 2010 through to year 2030. This section describes the forecast methodologies and results. Note that the forecasts are based on an unconstrained growth scenario, which assumes that the Airport will provide adequate facilities to accommodate growth, and that potential obstacles to growth (e.g., property available, land use restrictions, limited funding) can be overcome.

H.1 Forecasting Methods

As Ellington Airport is a non-towered facility, no formal record of operations is maintained. Thus, existing operations levels are based on estimations of annual use. Numerous approaches may be investigated to forecast future airport activity levels. The most common approaches generally incorporate regional population or economic conditions, industry trends, and past airport activity levels. As existing operations levels are based on estimations, multiple approaches were investigated for Ellington Airport:

- **Population Forecasting Method** – Uses the population forecasts of the Town of Ellington and Tolland County to represent the growth rates of Ellington Airport's based aircraft and operations.
- **CSASP Forecasting Method** – Uses the Connecticut Statewide Airport System Plan (CSASP) growth rate factors for based aircraft and operations at Ellington Airport.
- **Terminal Area Forecast Method** – Uses the FAA's Terminal Area Forecast, which is based on economic and historical trends at individual airports.
- **FAA Aerospace Forecasting Method** – Uses the Federal Aviation Administration's (FAA) nationwide growth rates for Active Fleet and Hours Flown.
- **Operations Per Based Aircraft Forecast Method** – Uses FAA guidance of the operations per a based aircraft with the FAA Aerospace Forecast based aircraft forecasts.

Through discussions with the airport owner and tenants, site visits, and review of the FAA's Airport Master Record, the 5010 Form, it is concluded that are a total of 31 based aircraft and 29,200 annual operations. There are 20 single-engine, five helicopters, and six ultralights. This information was used in the forecasts as the 2010 based year data.

Helicopters were forecast separately due to the nature of the helicopter activity at Ellington Airport. This activity is attributed to the presence of the flight school rather than market demand. As the CSASP and FAA Aerospace do not directly forecast ultralights, these were also forecast separately as well at the end of this appendix. Note that ultralights are not FAA registered or regulated aircraft.

Helicopters

The helicopter activity at Ellington Airport is due to the presence of the flight training facility of Northeast Helicopters, Inc. rather than market demand for helicopter activity. They currently have five based helicopters; each helicopter creates an estimated two flights per a day, or four operations. This would result is approximately 1,460 annual operations per helicopter, for a total of 7,300 annual operations. Discussion with Northeast Helicopter, Inc's management revealed that they intend to retain and operate five helicopters. The five based helicopters and 7,300 operations have been added to the recommended forecast for each year of the planning period, as shown in Table H-9

Ultralights

FAA records currently list six ultralights at Ellington Airport, which typically do not operate as often as single-engine piston aircraft. It is assumed that each ultralight creates 269 annual operations (half of the FAA guidance of 538 operations per a based aircraft) for a total of 1,614 annual operations. It is not anticipated for the number of ultralights to grow over the planning period. The based ultralights and operations have been added to the recommended forecast for each year of the planning period, as shown in Table H-9.

Population Forecasting Method

Population is a key indicator of based aircraft and operations levels at GA airports. In general, as the population of an airport's service area increases or decreases, based aircraft and operations levels typically increase or decrease correspondingly. Table H-1 shows the population forecast for the Town of Ellington, Tolland County, and the State of Connecticut based on the 2009 Connecticut Economic Resource Center (CERC). The CERC forecasts population through 2013, which were then extrapolated through 2030 for this study.

TABLE H-1 COMBINED POPULATION FORECAST

	Town of Ellington	Tolland County	Conn. State
2010	15,665	158,793	3,576,343
2015	17,380	170,224	3,666,650
2020	19,283	182,478	375,238
2025	21,395	195,614	3,854,163
2030	23,738	209,696	3,951,486
AAGR	2.1%	1.4%	0.5%

Source: CERC Town Profile 2009

As airports typically have a service area of a 20 to 30 mile radius, which extends beyond the Town lines, the County AAGR was used for this study. An Average Annual Growth Rate (AAGR) of 1.4 percent was applied to existing based aircraft and operations levels at Ellington Airport and applied through 2030 to develop the forecasts summarized in Table H-2 below. The 2010 base year annual operations were obtained from the FAA's Airport Master Record – 5010, with the estimated operations for helicopters and ultralights from the above forecasts removed.

TABLE H-2 POPULATION FORECASTING METHOD

Year	Based Aircraft	Annual Operations
2010	20	18,774
2015	21	20,125
2020	23	21,574
2025	25	23,127
2030	26	24,792
Change	**30%**	**32%**

Note: Does not include helicopters or ultralights.

As shown in Table H-2, under the Population Forecasting Method, total based aircraft are forecast to increase from 20 in 2010 to 26 by 2030, with total operations increasing to approximately 24,792 by 2030. This method results in high growth levels (an increase of approximately 30 and 32 percent over the 20-year planning period) for based aircraft and operations at Ellington Airport.

CSASP Forecasting Method

The 2006 Connecticut Statewide Airport System Plan (CSASP) was developed by ConnDOT in an effort "*to provide a comprehensive review of the current state aviation system, to support the continued operation and maintenance of Connecticut's airports, and to recommend modifications to the airport system to meet existing and projected aviation needs.*"

The AAGR used in the CSASP are based on a statewide forecast of registered aircraft and population. For the CSASP a based year of 2004 was used, with forecasts of based aircraft and operations to the year 2025. For this study, the 2010 base year from the CSASP of 32,154 was updated to reflect the current operational activity at the airport. As with the population forecast, the 2010 base year annual operations were obtained from the FAA's Airport Master Record – 5010, with the estimated operations for helicopters and ultralights from the above forecasts removed. The CSASP's AAGR of 0.4 percent for based aircraft and 1 percent for operations were applied to the updated activity data.

TABLE H-3 CSASP FORECASTING METHOD		
Year	**Based Aircraft**	**Annual Operations**
2010	20	18,774
2015	20	19,732
2020	21	20,738
2023	21	21,796
2030	22	22,908
AAGR	0.40%	1%
Change	**10%**	**22%**
Note: Does not include helicopters or ultralights.		

As shown in Table H-3 under the CSASP Forecasting Method, total based aircraft are forecast to increase from 20 in 2010 to 22 by 2030, with total operations increasing to approximately 22,908 by 2030.

Terminal Area Forecasting

The FAA publishes nationwide Terminal Area Forecasts (TAF) for individual airport historical and forecasted operational activity and based aircraft. This method relies upon the historical national share of activity as well as additional trends that affect the specific airport. While the TAF forecasts for many of the non-towered airports in the United States, Ellington is not among them.

FAA Aerospace Forecasting Method

The FAA publishes nationwide forecasts for GA activity. Their most recent publication is *Aerospace Forecasts Fiscal Years 2009-2025*. This publication provides AAGR by aircraft type. As discussed below, those AAGR were applied to existing based aircraft and operations levels at Ellington Airport (by aircraft type), and applied through 2030 to determine the forecasts summarized in Table H-4.

Based Aircraft – The based aircraft forecasts were developed using the *FAA General Aviation Active Fleet Forecasts*. The FAA forecasts the total GA aircraft fleet to increase at an AAGR of 0.9 percent nationwide (from 2008 to 2025), with the greatest growth forecast for rotorcraft, turbine, and light sport aircraft, and the lowest growth forecast for single- and multi-engine piston aircraft. Piston aircraft, the type based at Ellington, were forecast as negative growth from 2008 to 2010 and 0 percent growth from 2010 to 2030. Under this method, the Ellington Airport based aircraft forecasts were developed using an AAGR of 0 percent for Single-Engine Piston Aircraft. As such, the resulting based aircraft forecast is flat using this approach.

TABLE H-4 FAA AEROSPACE BASED AIRCRAFT				
Year	**Single-Engine**	**Twin-Engine**	**Turboprop/Jet***	**Total**
2010	20	0	0	20
2015	20	0	0	20
2020	20	0	0	20
2025	20	0	0	20
2030	20	0	0	20
* Typically requires long paved runways (>4,000 feet) Note: Does not include helicopters or ultralights.				

Operations – The operations forecasts were developed using the *FAA General Aviation Hours Flown Forecasts*. The FAA forecasts total GA hours flown to increase at an AAGR of 1.8 percent nationwide (from 2010 to 2025), with the greatest growth forecast for jet, rotorcraft, and light sport aircraft, and the lowest growth forecast for multi-engine piston aircraft. Under this method (in Table H-5), the Ellington Airport operations forecasts were developed using an AAGR 0.5 percent for Single-Engine Piston Aircraft, as consistent with the FAA hours flown forecasts.

Local operations are performed by aircraft that operate within the traffic pattern or take-off from the airport and stay within 20 miles of the airport. Itinerant operations are performed by aircraft arriving from (or departing to) an airport outside of the local area. Discussions with airport management and tenants revealed that the majority of the operations at Ellington Airport are considered local operations. Thus, a 90 percent local to 10 percent itinerant operational ratio was utilized in this study.

TABLE H-5 FAA AEROSPACE OPERATIONS			
Year	**Operations**		
	Total	**Local**	**Itinerant**
2010	18,774	16,897	1,877
2015	19,057	17,151	1,906
2020	19,345	17,411	1,935
2025	19,637	17,673	1,964
2030	19,933	17,940	1,993
Change	6%	6%	6%
Note: Does not include helicopters or ultralights.			

Table H-4 projects no growth in operations over the planning period due to the AAGR of 0 percent for based aircraft, resulting in a constant total based aircraft of 20. Table H-5 shows a growth of 1,159 annual operations through 2030.

Operations per a Based Aircraft

The FAA Advisory Circular 150/5300-13 *Airport Design* provides a planning guideline of 538 annual operations per a based aircraft for non-NPIAS[1] public use airports. A 90 percent local and 10 percent itinerant operational ratio was utilized based on the estimated percentage for Ellington Airport as discussed above. Table H-6 utilizes this guideline for annual operations rather than the AAGR's listed above for Table H-5.

TABLE H-6 OPERATIONS PER BASED AIRCRAFT

Year	Based Aircraft	Operations		
		Total*	Local	Itinerant
2010	20	10,760	9,684	1,076
2015	20	10,760	9,684	1,076
2020	20	10,760	9,684	1,076
2025	20	10,760	9,684	1,076
2030	20	10,760	9,684	1,076

* Based on 538 operations per based aircraft (FAA Advisory Circular 150/5300-13, Appendix 5)
Note: Does not include helicopters or ultralights

As the operational forecast in Table H-6 is based on the number based aircraft, the operations are constant over the planning period as well.

Summary of Forecasting Methods

Table H-7 summarizes the four forecasting methods developed for Ellington Airport.

TABLE H-7 SUMMARY OF FORECASTING METHODS

	1. Population		2. CSASP		3. FAA Aerospace		4. OPBA	
Year	**Based**	**Operations**	**Based**	**Operations**	**Based**	**Operations**	**Based**	**Operations**
2010	20	18,774	20	18,774	20	18,774	20	10,760
2015	21	20,125	20	19,732	20	19,057	20	10,760
2020	23	21,574	21	20,738	20	19,345	20	10,760
2023	25	23,127	21	21,796	20	19,637	20	10,760
2030	26	24,792	22	22,908	20	19,933	20	10,760
Change	**30%**	**32%**	**10%**	**22%**	**0%**	**6%**	**0%**	**0%**

Note: Does not include helicopters or ultralights.

As shown in Table H-7, of the four forecasting methods, the population forecasting method shows the greatest growth in based aircraft and annual operations over the planning period.

[1] NPIAS refers to the airports included by the FAA in the National Plan of Integrated Airport System.

Recommended Forecast

Each of the four forecasting methods in Table H-7 has a reasonable justification for its use, but also has their limitations. As no method can be identified as more accurate than the others, a combination of all four forecasting methods is recommended for Ellington Airport. The forecasts were recommended because they incorporate local, state, and national trends. Table H-8 shows the averaged forecast for based aircraft and operations at Ellington Airport, without helicopters and ultralights.

TABLE H-8 AVERAGED FORECAST

Year	Based	Operations
2010	20	16,771
2015	20	17,419
2020	21	18,104
2023	22	18,830
2030	22	19,598
Change	**10%**	**17%**

Table H-9 shows the recommended forecast for Ellington Airport, with the five helicopters and six ultralights that were forecasted separately. Table H-9 shows a growth of two aircraft with an increase of 2,800 annuals operations by 2030.

TABLE H-9 RECOMMENDED FORECAST

Year	Based	Operations
2010	31	25,700
2015	31	26,300
2020	32	27,000
2023	33	27,700
2030	33	28,500
Change	**6%**	**11%**
Note: Operations rounded		

H.2 Feasibility of Very Light Jets at Ellington Airport

Aircraft Technology Advances

The Next Generation Air Transportation System (NextGen) is the Federal Aviation Administration's (FAA) plan to modernize the National Airspace System (NAS) through 2025. Through NextGen, the FAA is addressing the impact of air traffic growth by increasing NAS capacity and efficiency while simultaneously improving safety, reducing environmental impacts, and increasing user access to the NAS.

The GA aircraft that will be operating in the upcoming NextGen environment will enjoy the efficiencies provided by developing technologies in satellite-based navigation, up-linked weather, communications data, and collision avoidance networks. The modernization of the existing aircraft continues to be a popular approach to advancing the technology. The installation of modernized avionics technology on existing airframes as well as new engines to provide better fuel efficiencies will most likely be the focus for existing manufacturers as they compete against new age aircraft currently in development. These newer aircraft, which make use of composite material technologies, more powerful and fuel efficient engines, and an updated suite of avionics, will take maximum advantage of the technologies that are available or will be available in the next several years.

Very Light Jet Industry

Variations of Very Light Jets (VLJs), or microjets, have started arriving in the GA fleet after several years of development. Orders for the Cessna Mustang, Phenom100, and the Eclipse Jet have demonstrated that a market does exist for the mission capabilities and cost efficiencies that these aircraft have been designed to provide. The current market downturn has affected all aspects of the economy including the VLJ industry. Some backorders for VLJs have been cancelled and a significant portion of the investment/venture capital for the development of these aircraft has been withdrawn. The slow economy has resulted in some reshuffling of companies and ownership. For example, Eclipse Aircraft, once the leader in orders, is now out of business due to bankruptcy.

Eclipse 500 Jet

The most promising "air taxi" (i.e., air charter service) company, DayJet, which had placed 1,400 orders for the Eclipse 500, also went out of business due to the lack of capital funding. DayJet was the first operator of "Per-Seat, On-Demand" jet service. The company had flown over 9,000 segments totaling more than one million miles, all the while achieving an industry leading, 95 percent on-time performance record and a 93 percent customer satisfaction rating. DayJet demonstrates there is a demand for this service and that its concept of per-seat, on-demand jet service has merit. Although DayJet could not raise the required capital funding to continue operation, in 2008 there were still ten other VLJ companies that are either in or trying to get into the VLJ air taxi market. Even with these funding challenges, manufacturers believe that demand will build over time. As such, they continue to design and test their own versions of the VLJ for a market that still looks promising.

Cessna Mustang

The backlog of VLJ category aircraft orders demonstrates that the interest in this class of aircraft is still strong, but not as strong as it once was. The FAA has stated in their Aerospace Forecast

Fiscal Years 2010-2030: "The current forecast calls for 440 units will join the fleet over the next three years, with an average of 216 a year through 2030." This forecast is significantly less than forecast in 2008, which called for 450 to 500 VLJs to enter the market each year through 2025.

While VLJs may not populate the corporate fleet as quickly as predicted, they established a demand niche in the overall GA fleet. Thus, the specter of thousands of VLJs converging on smaller GA airports that have never had much jet traffic in the past will most likely not happen in the intermediate future. However, there are many airports (particularly around congested metropolitan areas) that will see some evidence of VLJs in the years to come. This is particularly true at airports that have already experienced increased number of corporate operations in the recent past. In some cases, the need to provide support facilities, especially the availability of Jet A fuel, will be critical at airports that do not already have that capability.

VLJs at Ellington Airport

VLJs were designed to operate at airports with runways as short as 3,000 feet with a non-precision instrument approach (NPI) and availability of Jet-A fuel. The clientele that utilize a VLJ service tend to be business oriented and expect a certain level of service at each airport they visit, including a Fixed Based Operator (FBO).

Based on the findings of this report, Ellington would be able to satisfy some of these items, but not all. While a 3,000 foot runway is feasible based on the land available, the CTDEP would most likely require extensive justification and mitigation for the wetlands that would be impacted from this alternative. While a 3,200 foot runway is the recommended length for a NPI, they have been designed for runways as short as 2,400 feet under certain circumstances. Under light loads (limited passengers and fuel volume), some VLJ could potentially utilized a 2,500 foot long runway. The feasibility of an NPI would need to be evaluated by the FAA. A full length, parallel taxiway, medium intensity lighting, and runway markings and signs would be recommended prior to the implementation of a NPI. Ellington does provides Jet-A via a 2,000 gallon storage tank.

The Town of Ellington does not have a major corporate/business center, which is the primary demand driver for business-oriented air travel. The availability of Hartford-Bradley and Hartford-Brainard Airports closer to the economic business centers limits the need and desirability for business travelers to utilize Ellington Airport. Also, Ellington does not currently have a FBO to service the needs of business aircraft or travelers. Thus, if the Airport is acquire and improved, it is still unlikely that Ellington Airport would have more than occasional flight by VLJs, or other twin-engine and turbine-powered business aircraft.